

## CLAIMS

### What is claimed is:

1. An automatic gain control (AGC) for a wireless communication network to use the signal saturation property as a standard for entering an acquisition mode for quick gain  
5 tuning, the AGC comprising:

an average power computing unit, which computes the average power of a received signal;

a power range monitoring unit, which monitors the power range variation of the received signal;

10 a logic unit, which controls the signal transmission within the AGC according to the variation of the power range;

a tracking unit, which performs gain tracking according to the control of the logic unit; and

15 an acquisition unit, which performs gain acquisition according to the control of the logic unit, wherein the acquisition unit further comprises:

a gain returning unit, which returns the current gain to a default value;

a gain increasing unit, which increases the current gain; and

a gain decreasing unit, which decreases the current gain.

20 2. The AGC of claim 1, wherein the logic unit switches the AGC to the acquisition mode when the power of the received signal monitored by the power range monitoring unit changes from below a saturation threshold to above the saturation threshold and notifies the gain returning unit to tune the gain to a default gain value.

3. The AGC of claim 1, wherein the logic unit notifies the gain decreasing unit to decrease the current gain by a default step in the acquisition mode when the power of the received signal monitored by the power range monitoring unit is greater than the upper limit of a tracking range.

5        4. The AGC of claim 1, wherein the logic unit notifies the gain increasing unit to increase the current gain by a default step in the acquisition mode when the power of the received signal monitored by the power range monitoring unit is smaller than the lower limit of a tracking range.

10       5. The AGC of claim 1, wherein the logic unit switches the AGC to a tracking mode for gain tracking when the power of the received signal monitored by the power range monitoring unit falls within the tracking range.

6. An automatic gain control (AGC) method for a wireless communication network to use the signal saturation property as a standard for entering an acquisition mode for quick gain tuning, the AGC method comprising the steps of:

15                computing the average power of a received signal and monitoring the power range variation of the received signal;

                  entering a gain acquisition mode when the monitored signal power changes from below a saturation threshold to above the saturation threshold;

                  returning the current back to a default gain;

20                re-computing the signal average power and, if the monitored power still does not fall within the tracking range, tuning the gain accordingly until the signal average power falls within the tracking range; and

                  entering a gain tracking mode for gain tracking.

7. The AGC method of claim 6, wherein the current gain is decreased when the

received signal power is greater than the upper limit of the tracking range after the AGC enters the acquisition mode.

8. The AGC method of claim 7, wherein the step of decreasing the current gain reduces the current gain by a default step.

5        9. The AGC method of claim 6, wherein the gain is increased when the received signal power is smaller than the lower limit of the tracking range after the AGC enters the acquisition mode.

10. The AGC method of claim 9, wherein the step of increasing the current gain raises the current gain by a default step.